

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SHADI L. MALHOTRA

Appeal No. 96-3946
Application No. 08/208,317¹

ON BRIEF

Before THOMAS, HAIRSTON, and GROSS, Administrative Patent Judges.

GROSS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 32, which are all of the claims pending in this application.

The appellant's invention relates to a printing process of ejecting an aqueous ink onto a recording sheet which

¹ Application for patent filed March 10, 1994.

Appeal No. 96-3946
Application No. 08/208,317

includes a substrate and two coating layers, each coating layer being formed of a binder and microspheres. Claim 1 is illustrative of the claimed invention, and it reads as follows:

1. A printing process which comprises the steps of (a) incorporating into an ink jet printing apparatus containing an aqueous ink a recording sheet which consists essentially of (1) a substrate; (2) a first coating layer which comprises a binder and microspheres having an average particle diameter of at least about 1 micron; (3) a second, ink-receiving coating layer situated so that the first coating layer is between the second, ink-receiving coating layer and the substrate, said second, ink-receiving layer comprising a hydrophilic binder and microspheres having an average particle diameter of at least about 1 micron; (4) an optional antistatic agent; (5) an optional biocide; and (6) an optional filler; and (b) causing droplets of the ink to be ejected in an imagewise pattern onto a surface of the recording sheet containing microspheres, thereby generating images on the recording sheet.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Miyamoto et al. (Miyamoto)	4,460,637	Jul. 17, 1984
Ayers et al. (Ayers)	4,575,729	Mar. 11, 1986
Vieira et al. (Vieira)	5,073,448	Dec. 17, 1991

Claims 1 to 32 stand rejected under 35 U.S.C. § 112, second paragraph as being vague and indefinite.

Appeal No. 96-3946
Application No. 08/208,317

Claims 27, 28, 31, and 32 stand rejected under 35 U.S.C. § 112, first paragraph, as containing new matter.

Claims 1 to 12, 27, 28, and 32 stand rejected under 35 U.S.C. § 103 as being unpatentable over Miyamoto.

Claims 13 to 24 and 31 stand rejected under 35 U.S.C. § 103 as being unpatentable over Miyamoto in view of Ayers.

Claims 25 and 26 stand rejected under 35 U.S.C. § 103 as being unpatentable over Miyamoto in view of Vieira.

Claims 29 and 30 stand rejected under 35 U.S.C. § 103 as being unpatentable over Miyamoto in view of Ayers and Vieira.

Reference is made to the Examiner's Answer (Paper No. 10, mailed June 10, 1996) for the examiner's complete reasoning in support of the rejections, and to the appellant's Brief (Paper No. 9, filed March 04, 1996) for the appellant's arguments thereagainst.

OPINION

As a preliminary matter we note that appellant indicates on page 4 of the Brief (with reasons as set forth in 37 CFR § 1.192(c)(5) and (c)(6)) that the claims do not stand or

Appeal No. 96-3946
Application No. 08/208,317

fall together. Appellant groups the claims as follows: (1) claims 1 through 12, (2) claims 13 through 24 and 31, (3) claims 25, 26, 29, and 30, and (4) claims 27, 28 and 32².

We have carefully considered the claims, the applied prior art references, and the respective positions articulated by the appellant and the examiner. As a consequence of our review, we will affirm the 112 second paragraph rejection of claims 7, 8,

10, 11, 19, 20, 22, and 23, but reverse the 112 second paragraph rejection of the remaining claims, affirm the 112 first paragraph rejection of claims 27, 28, 31, and 32, affirm the obviousness rejection of claims 1 to 12, 25, and 26, and reverse the obviousness rejections of claims 13 through 24, and 27 through 32.

The examiner first objects to the use of "optional" in independent claims 1 and 13. She states (Answer, page 4) that "'optional' is not definite since the limitation does not clearly set forth the metes and bounds of the patent

² We note that claim 32 is identical to claim 28.

protection desired." Appellant asserts (Brief, page 18) that the use of the term "optional" does not render the claims indefinite and cites Ex parte Cordova, 10 USPQ2d 1949 (Bd. Pat. App. & Int. 1987), Ex parte Head, 214 USPQ 551 (Bd. App. 1981), and Ex parte Wu, 10 USPQ2d 2031 (Bd. Pat. App. & Int. 1989), as evidence that the Board has previously upheld the use of the term "optional." See also Ex parte Holt, 19 USPQ2d 1211 (Bd. App. & Int. 1991). In response to appellant's arguments, the examiner adds (Answer, page 13), "It is not 'optional' taken alone that obfuscates the claims, but the fact that calculated ranges of weight percentages depend upon the claims of the optional constituents. How do these ranges differ if the optional constituents are included?"

The term "optional" taken alone does not render the claims indefinite, as admitted by the examiner. The term merely denotes alternatives. As to the examiner's position that the calculated ranges of weight percentages are unclear since they

Appeal No. 96-3946
Application No. 08/208,317

depend upon the "optional" components, no ranges of weight percentages are recited in claims 1 and 13. Such considerations would only arise for those claims which recite weight percentages of at least one constituent. Still, "claims are not to be considered in a vacuum, 'but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art.' When considered in the light of the prior art and the specification, claims otherwise indefinite may be found reasonably definite." See In re Kroekel, 504 F.2d 1143, 1146, 183 USPQ 610, 612 (CCPA 1974). In the present case, the weight percentage range for each element is disclosed, and one of ordinary skill in the art would know how to manipulate the amounts within the ranges if other components were being added. Further, if the examiner's concern is that the total weight percent could be more than 100% if the optional components were included, the court in In re Kroekel, supra, held that "a rejection based on indefiniteness cannot stand simply because the

Appeal No. 96-3946
Application No. 08/208,317

proportions actually recited in the claims may be read in theory to include compositions that are impossible in fact to formu-late." Accordingly, the term "optional" in the claims does not render the claims indefinite.

The examiner further questions (Answer, pages 5-6) whether the coating weight in claims 7, 8, 10, 11, 19, 20, 22, 23, 27, 28, 31, and 32 refers to a dry coating weight or a wet coating weight. However, the relative weight percentages remain the same whether the coating is wet or dry. Accordingly, the failure to indicate whether the coating weight is for a wet or a dry coating does not render the claims indefinite.

The examiner asserts (Answer, page 5) that in claims 7, 8, 10, 11, 19, 20, 22, and 23, "'the solid contents' lack antecedent basis and is therefore indefinite. It is not clear as to what defines the solid contents." Appellant contends (Brief, page 19) that

The meaning of "solids content" is clear and unambig-uous to those in the coating art. In addition, the working examples at pages 27 and 28 clearly indicate the meaning of the term "solids content" to one of ordinary skill in the art; specifically, this term refers to the solid contents of the coating composition that are admixed with a

Appeal No. 96-3946
Application No. 08/208,317

solvent for coating onto the substrate, subsequent to which the solvent evaporates from the coating.

Turning to the specification, we find no definition of "solids content." Furthermore, the description of the microspheres on page 9 of the specification says:

The first coating layer, situated between the second ink-receiving layer and the substrate, typically contains microspheres in an amount of from about 0.25 to about 50 percent by weight, and preferably from about 2.5 to about 25 percent by weight, although the amount can be outside these ranges.

A similar description of the microspheres in the second layer appears in the paragraph bridging pages 11 and 12 of the specification, but with ranges of 0.1 to 10 percent and preferably 0.1 to 3 percent. In other words, the percentages claimed are identical to those recited in the specification, but "in the solids content" does not appear in the above referenced sections of the specification. Therefore, it is unclear how "in the solids content" limits the claims, since the ranges are the same as in the specification where the phrase does not appear. Appellant refers to the examples on pages 27 and 28, wherein the weight percent of solids in a

solvent is stated. Yet, the weight percentages of solids recited in the examples differs from the claimed weight percentages. Accordingly, the use of the phrase "in the solids content" is confusing at best. Consequently, we

must agree with the rejection of claims 7, 8, 10, 11, 19, 20, 22, and 23 under 35 U.S.C. § 112, second paragraph.

The examiner (Answer, page 4) further rejects claims 27, 28, 31, and 32 under 35 U.S.C. § 112, first paragraph, as containing new matter. She contends that the weight percentages of the binder were not disclosed in the specification as originally filed. The appellant suggests that the percentages are indirectly disclosed, since the weight percentages of the microspheres are recited in the specification.

We agree that the percentages of the binder can be calculated using what is explicitly disclosed, but the calculated ranges do not match those now claimed. For example, for the first coating layer, the microspheres are present in an amount of 0.25 to 50 percent or preferably 2.5 to 25 percent. Thus,

Appeal No. 96-3946
Application No. 08/208,317

the percent of binder (absent any optional elements) would be 50 to 99.75 or preferably 75 to 97.5 percent. Thus, the claimed range of at least 75 percent could be considered to be disclosed. However, claims 28 and 30 recite a range of at least about 97 percent, which does not correspond with either calculated range. Similarly, for the second coating layer, the microspheres are present in an amount of 0.1 to 10 percent or preferably 0.1 to 3 percent. Calculating the percent of binder yields 90 to 99.9

percent or preferably 97 to 99.9 percent. Yet the claimed percentage is at least about 75 percent in all four claims. Since at least 75 percent does not even remotely correspond to the calculated ranges, we have to agree that the claimed ranges are not supported by the original disclosure.

With respect to the obviousness rejections, independent claim 1 requires a recording sheet

which consists essentially of . . . (2)a first coating layer which comprises a binder and microspheres having an average particle diameter of at least about 1 micron;(3)a second, ink-receiving coating layer . . . comprising a hydrophilic binder and microspheres having an average particle diameter of at least about 1 micron. (emphasis added)

In other words, each of the two coating layers includes microspheres with an average particle diameter of at least about 1 micron. Miyamoto discloses (column 5, line 46-column 6, line 9):

In an embodiment of the invention in which the ink receptive layer is composed of two or more strata, it is necessary that the pore radius distribution of the uppermost layer shows at least one peak at 0.2 to 10 μm . This requirement can be met by coating with a particulate pigment of 1 to 50 μm in average size . . . It is, therefore, necessary to dispose an intermediate layer (second layer) of a large ink-receptive capacity, in which layer the total pore volume of pores of 0.05 μm or below in size is 0.2 ml/g or above. To provide such an intermediate layer, a pigment having a particle size of 0.2 μm or below is coated by various means to form a layer. (emphasis added)

Thus, Miyamoto requires at least one layer with particles with an average diameter of 1 to 50 μm and a second layer with particles having an average diameter of 0.2 μm or below.

The examiner contends (Answer, page 6) that Miyamoto discloses an average particle size of 1-50 microns for each of two layers. She focuses on the phrase "two or more strata" in Miyamoto, asserting that "or more" suggests a device with two of the first layer and therefore two layers with particles of diameter 1 to 50 μm . We agree that Miyamoto suggests a

Appeal No. 96-3946
Application No. 08/208,317

recording medium with a second uppermost layer, thereby totaling three layers altogether. However, as pointed out by the examiner (Answer, pages 10-11), the present claims say "consists essentially of," which has been defined as "includ[ing] the listed ingredients and [being] open to unlisted ingredients that do not materially affect the basic and novel properties of the invention." PPG Industries Inc. v. Guardian Industries Corp., 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353 (Fed. Cir. 1998); In re Herz, 537 F.2d 549, 190 USPQ 461, 463 (CCPA 1976). We interpret "ingredients that . . . materially affect" as only being directed to elements that materially affect in a deleterious manner. The issue, therefore, is whether the intermediate layer of Miyamoto

with particles having an average diameter of 0.2 μm or lower would materially and detrimentally affect the basic and novel properties of the invention.

In the specification (page 4), appellant discloses that the purpose of the invention is to provide an improved recording sheet suitable for ink jet printing and which "exhibit rapid drying times when imaged with aqueous inks." Miyamoto states in column 2, lines 62-67, that the intermediate layer with small particles provides high image resolution and high ink absorptivity. In column 2, lines 44-49, Miyamoto discloses that a larger and a higher rate of ink absorption makes the ink dry faster. In other words, the addition of Miyamoto's intermediate layer would seem to enhance the properties of appellant's recording sheet, or rather, not to materially and deleteriously affect the basic and novel properties of the invention. Accordingly, we find that claim 1 and claims 2 through 12, all of which depend from claim 1, would have been obvious over Miyamoto.

Independent claim 13 is identical to claim 1 with a further step of "thereafter exposing the substrate to microwave radiation, thereby drying the recording liquid on the recording sheet." The examiner relies on Ayers for motivation to include a step of applying microwave radiation. The examiner states

Appeal No. 96-3946
Application No. 08/208,317

(Answer, page 8) that it would have been obvious to use the microwave drying of Ayers "because the microwave drying of Ayers, et al. dries the ink as desired by Miyamoto, et al."

She further asserts (Answer, page 11) that

Ayers does not limit drying to any particular recording sheet. And Miyamoto does not prohibit drying, in fact Miyamoto, et al. teach to dry the ink receptive layer in example 1. Therefore, Miyamoto, et al. desire a dried recording medium. Appellants have not given sufficient reason why Miyamoto would not want a dried recording medium in the ink jet art.

First, the drying of Example 1 of Miyamoto referenced by the examiner (Answer, page 11), occurs during the preparation of the medium for use in a printing process, not during the printing process itself. Furthermore, Miyamoto discloses in column 2, lines 54-62, that

for the purpose of producing an ink jet recording sheet having a high rate of ink absorption so as to render the ink apparently dry immediately after the application, it is most effective to construct the uppermost layer, with which the ink droplets come in first contact, with pigment particles of a suitable size to utilize the capillary effect of the interparticle voids or to provide a porous layer of the similar pore size or pore radius to absorb the ink. (emphasis added)

In other words, Miyamoto discloses that the recording medium dries immediately by itself by virtue of the porosity of the

uppermost layer, and thereby teaches away from additional drying of the medium after printing. Therefore, the examiner's statement that Miyamoto desires to dry the ink lacks basis in the reference.

We do agree with the examiner that Ayers suggests to the skilled artisan that ordinarily a recording medium needs to be dried after printing, and that known methods include microwave drying. However, since Miyamoto specifies a medium that dries immediately without external drying means, adding a microwave drying step to Miyamoto's method would appear to be contrary to the teachings of Miyamoto. Therefore, it would not have been obvious to one of ordinary skill in the art to add a microwave drying step to Miyamoto. Accordingly, the examiner has failed to establish a prima facie case of obviousness, and we cannot maintain the rejections of claim 13 and claims 14 through 24 and 31, which depend from claim 13.

For the addition of biocides and antistatic agents, for claims 25, 26, 29, and 30, the examiner submits (Answer, pages 8-9) that Vieira teaches in column 7, line 67-column 8, line 4,

Appeal No. 96-3946
Application No. 08/208,317

using biocides and/or antistatic agents for ink jet recording mediums. She concludes:

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the ink jet recording medium of Miyamoto, et al. with biocides and antistatic agents as taught by Vieira, et al. because biocides and antistatic agents are known additives for ink jet printing mediums.

We agree that Vieira suggests that biocides and antistatic agents are conventional additives for recording mediums.

Consequently, we find that the addition of such biocides and antistatic agents to the recording medium of Miyamoto would have been obvious to one of ordinary skill in the art for the purposes that their names suggest. Therefore, we agree with the examiner that claims 25 and 26 would have been obvious over Miyamoto in view of Vieira.

As to claims 29 and 30, however, Vieira does not remedy the deficiency in the rejection of claim 13, from which claims 29 and 30 depend. Accordingly, we must reverse the rejections of claims 29 and 30.

With respect to claims 27, 28, and 32, the examiner (Answer, page 6) points to Example 1 and column 7, lines 21-26, to show that Miyamoto teaches a 20% solids composition in

Appeal No. 96-3946
Application No. 08/208,317

the coatings (and thus 80% binder). However, in column 7 Miyamoto teaches that the amount of binder should be no more than 100 parts by weight to 100 parts by weight of pigment. Similarly, in Example 1, the amount of binder is 15 parts by weight to 100 parts by weight of pigment. In other words, the weight percentage of

binder disclosed by Miyamoto is less than 50 percent, which does not even approach the claimed ranges of at least 75 weight percent and at least 97 weight percent. Therefore, we cannot uphold the rejection of claims 27, 28, and 32 under 35 U.S.C. § 103.

CONCLUSION

The decision of the examiner to reject claims 1 through 32 under 35 U.S.C. § 112, second paragraph is affirmed for claims 7, 8, 10, 11, 19, 20, 22, and 23 and reversed for claims 1 through 6, 9, 12 through 18, 21, and 24 through 32.

Appeal No. 96-3946
Application No. 08/208,317

The decision of the examiner to reject claims 27, 28, 31, and 32 under 35 U.S.C.

§ 112, first paragraph is affirmed. The decision of the examiner to reject claims 1 through 32 under 35 U.S.C. § 103 is affirmed for claims 1 through 12, 25, and 26 and reversed for claims 13 through 24, and 27 through 32.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

JAMES D. THOMAS)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
KENNETH W. HAIRSTON)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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ANITA PELLMAN GROSS)	
Administrative Patent Judge)	

Appeal No. 96-3946
Application No. 08/208,317

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Appeal No. 96-3946
Application No. 08/208,317

RONALD ZIBELLI
XEROX CORPORATION
XEROX SQUARE 020
ROCHESTER, NY 14644